

UNIT 1

INTRODUCTION TO BIM & REVIT STRUCTURE

Learn the fundamentals of Building Information Modeling (BIM) and get familiar with the Revit Structure interface and basic tools.



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UNIT OVERVIEW

In this unit, you will be introduced to BIM concepts and explore the Revit Structure interface. You will learn about key interface components, navigation tools, project browser, properties palette, structural templates, and essential productivity shortcuts.

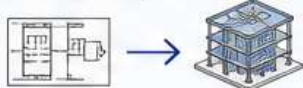
YOU WILL LEARN

- ✓ Introduction to BIM
- ✓ Revit Structure Interface
- ✓ Project Browser
- ✓ Properties Palette
- ✓ Navigation Tools
- ✓ Structural Templates
- ✓ Keyboard Shortcuts



WHAT IS BIM?

BIM (Building Information Modeling) is a process that involves creating and managing digital representations of physical and functional characteristics of places.



2D DRAWING

BIM MODEL



TIP

Customize your interface for better productivity using the View tab > User Interface options.

REVIT STRUCTURE INTERFACE OVERVIEW

QUICK ACCESS TOOLBAR
Shortcuts to common commands.

RIBBON
Access all tools and commands.

VIEW CONTROL BAR
Control the scale, detail level and visual style of the view.

OPTIONS BAR
Modify and create elements settings.

PROJECT BROWSER
Manage views, sheets, families, schedules, and other project data.

DRAWING AREA
Create and view your structural model in 2D and 3D.

NAVIGATION TOOLS
Pan, Zoom, Orbit, Zoom Window, Fit to Window, etc.

PROPERTIES PALETTE
View and edit properties of selected elements and views.

KEY TOPICS COVERED



INTRODUCTION TO BIM

Understand BIM concepts and its benefits in structural projects.



REVIT STRUCTURE INTERFACE

Explore the user interface elements and their functions.



PROJECT BROWSER

Organize and manage project views, sheets, schedules, families, and more.



PROPERTIES PALETTE

Learn how to view and modify properties of elements and views.



NAVIGATION TOOLS

Use navigation tools to efficiently move and control views.



STRUCTURAL TEMPLATES

Use structural templates to start projects with standard settings.



KEYBOARD SHORTCUTS

Learn essential shortcuts to improve modeling efficiency.

STRUCTURAL TEMPLATES

Start with pre-defined structural templates to save time and maintain project standards.



Metric
Structural
Template



Imperial
Structural
Template



Revit
Default
Template



LEARNING OUTCOMES

- Understand BIM and Revit Structure environment
- ✓ Navigate Revit interface confidently
- ✓ Manage project data using Project Browser
- ✓ Edit element and view properties
- ✓ Use essential tools and templates to start modeling

UNIT 2

PROJECT SETUP

Learn how to create and configure a new structural project, set up levels, grids, and organize your model for efficient workflow.



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UNIT OVERVIEW

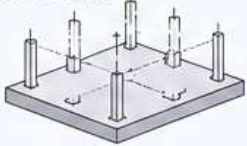
In this unit, you will learn how to start a new structural project and set up the essential elements that form the foundation of your model. Proper project setup ensures accuracy, consistency, and smooth coordination throughout the project.

YOU WILL LEARN

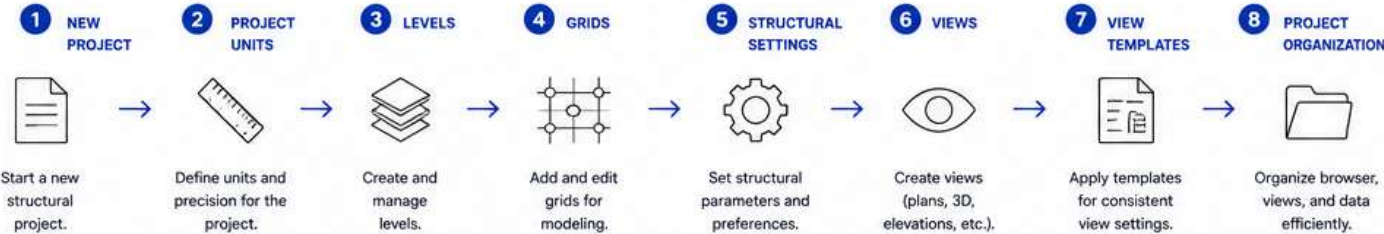
- ✓ New Structural Project
- ✓ Project Units
- ✓ Levels
- ✓ Grids
- ✓ Structural Settings
- ✓ Views
- ✓ View Templates
- ✓ Project Organization

WHY IT MATTERS?

A well-structured project setup improves model accuracy, data management, and collaboration, saving time and reducing errors in later stages.

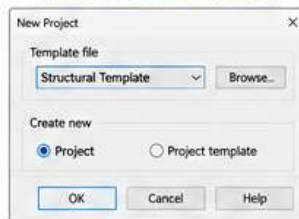


PROJECT SETUP WORKFLOW



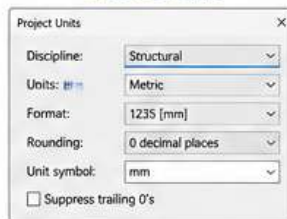
KEY SETUP ELEMENTS

1. NEW STRUCTURAL PROJECT



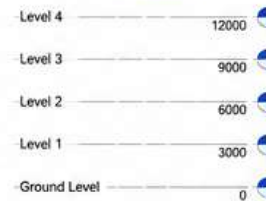
Start with a structural template to ensure correct settings and standards.

2. PROJECT UNITS



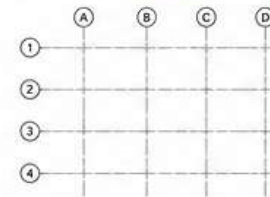
Set units, format, rounding, and precision as per project requirements.

3. LEVELS



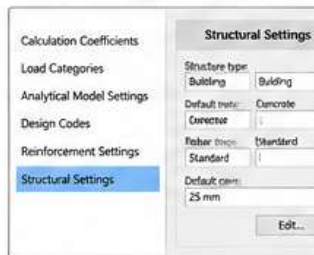
Create levels to define the height and story structure of the building.

4. GRIDS



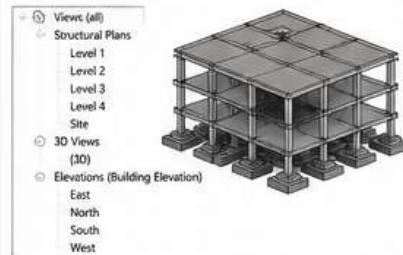
Add horizontal and vertical grids for accurate column and element placement.

5. STRUCTURAL SETTINGS



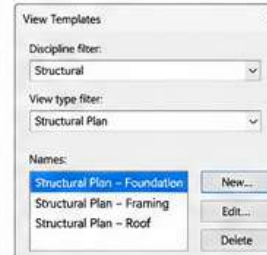
Define structural parameters, materials, codes, and rebar settings.

6. VIEWS



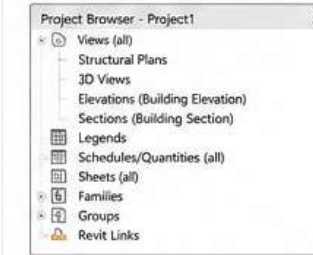
Create essential views like plans, 3D, elevations, sections for modeling and documentation.

7. VIEW TEMPLATES



Use view templates for consistent graphics, visibility, and annotation.

8. PROJECT ORGANIZATION



Organize browser structure, rename views, and manage data efficiently.

KEY TOPICS COVERED

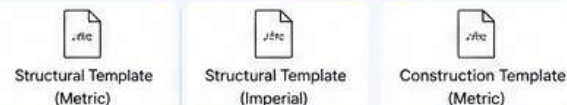
- 1. NEW STRUCTURAL PROJECT**
 - Using structural templates
 - Project information
- 2. PROJECT UNITS**
 - Discipline
 - Units and format
 - Rounding and precision
- 3. LEVELS**
 - Create levels
 - Modify levels
 - Level properties
- 4. GRIDS**
 - Create grids
 - Modify grids
 - Grid bubbles and visibility
- 5. STRUCTURAL SETTINGS**
 - Structure type
 - Materials
 - Rebar shape and cover
- 6. VIEWS**
 - Plan, 3D, elevation, section
 - View range
 - Visibility control
- 7. VIEW TEMPLATES**
 - Create templates
 - Apply templates
 - Manage templates
- 8. PROJECT ORGANIZATION**
 - Project Browser
 - Renaming and grouping
 - Worksets overview



TIP

Always set units, levels, and grids correctly at the beginning to avoid modeling and coordination issues later.

COMMON TEMPLATES USED



LEARNING OUTCOMES

- ✓ Set up a new structural project with correct units and settings.
- ✓ Create and manage levels and grids.
- ✓ Configure structural settings and organize project data.
- ✓ Prepare your model for efficient and accurate structural modeling.

UNIT 3

FOUNDATIONS

Learn how to model and manage different types of foundations in Revit Structure for accurate structural design.



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UNIT OVERVIEW

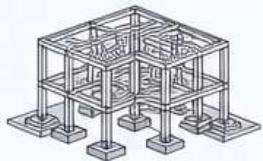
In this unit, you will learn to create and model various types of foundations in Revit Structure. You will understand the tools, settings, parameters, and best practices for accurate foundation modeling and documentation.

YOU WILL LEARN

- ✓ Isolated Footings
- ✓ Wall Footings
- ✓ Strip Footings
- ✓ Raft Foundations
- ✓ Foundation Slabs
- ✓ Foundation Walls
- ✓ Foundation Parameters

WHY FOUNDATIONS MATTER?

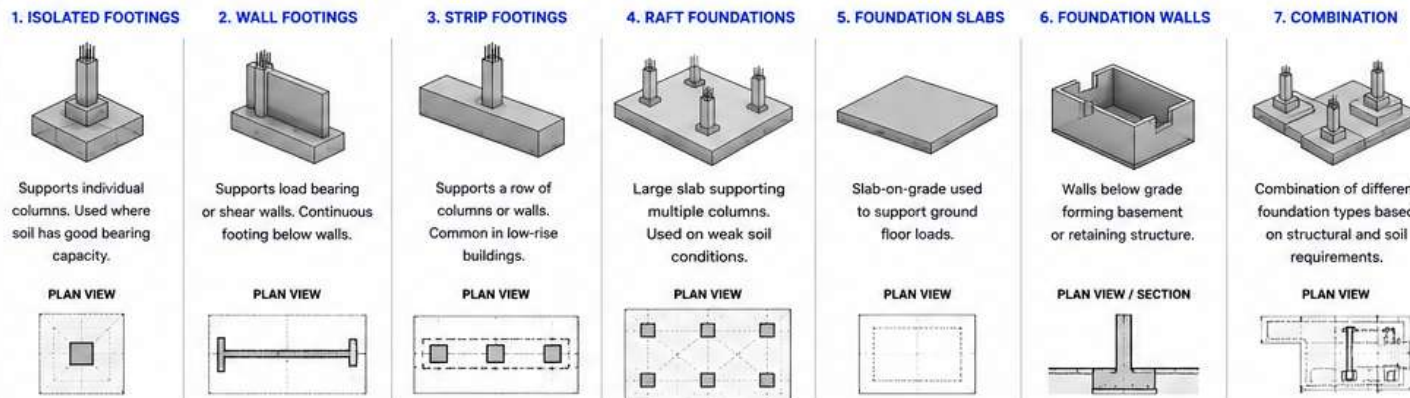
Foundations transfer loads safely from the structure to the ground. A well-modeled foundation ensures structural stability, accurate quantity takeoff, and coordinated construction documentation.



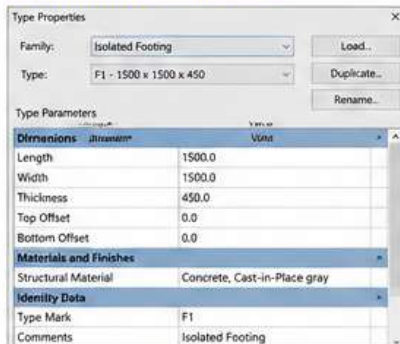
FOUNDATION WORKFLOW



TYPES OF FOUNDATIONS IN REVIT



FOUNDATION PARAMETERS



Dimensions
Set length, width, thickness, and offsets.

Structural Material
Assign concrete or other structural materials.

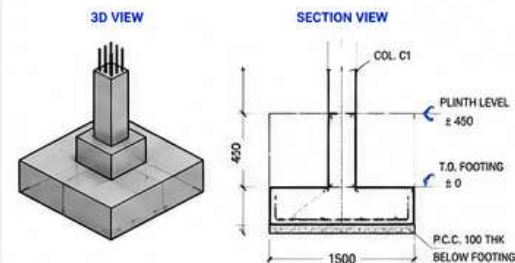
Identity Data
Add type mark, comments and descriptions.

Rebar Cover
Define cover settings for reinforcement.

Analytical Properties
Set analytical behavior and load transfer.

Phasing
Define phase created and phase demolished.

EXAMPLE: ISOLATED FOOTING



KEY TOPICS COVERED

- 1 ISOLATED FOOTINGS**
 - Create and edit isolated footings
 - Modify size, thickness, offset
- 2 WALL FOOTINGS**
 - Continuous wall footings
 - Sloped and stepped footings
- 3 STRIP FOOTINGS**
 - Create strip footings
 - Adjust width and thickness
- 4 RAFT FOUNDATIONS**
 - Create raft slabs
 - Edit boundary and thickness
- 5 FOUNDATION SLABS**
 - Slab on grade
 - Modify edges and slope
- 6 FOUNDATION WALLS**
 - Create foundation walls
 - Edit height and thickness
- 7 FOUNDATION PARAMETERS**
 - Set materials and covers
 - Edit analytical properties

LEARNING OUTCOMES

- ✓ Create different types of foundations.
- ✓ Set and modify foundation parameters.
- ✓ Apply materials and rebar cover correctly.
- ✓ Understand foundation behavior and usage.
- ✓ Produce accurate foundation documentation.

BEST PRACTICES



TIP

Always check soil and structural requirements before selecting the type of foundation. Use reference levels and grids for accurate placement.



Use project base point for accurate positioning.



Maintain proper naming and type mark for clarity.



Check interferences with other models and elements.



Review in multiple views (3D, section, plan).



Create schedules for foundation quantities.

NEXT UNIT



Unit 4: Structural Modeling

Learn to model columns, beams, floors, walls and other structural elements.

UNIT 4

STRUCTURAL MODELING

Learn how to create and modify primary structural elements to build a complete structural model in Revit Structure.



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UNIT OVERVIEW

In this unit, you will learn to model the major structural elements such as columns, beams, floors, walls, braces, and roof structures. You will explore different tools, editing options, and best practices to create an accurate and coordinated structural model.

YOU WILL LEARN

- ✓ Structural Columns
- ✓ Beams
- ✓ Beam Systems
- ✓ Braces
- ✓ Structural Walls
- ✓ Floors
- ✓ Roof Structures

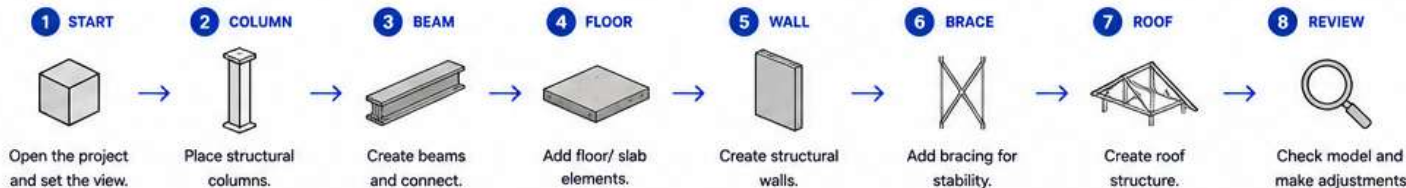


WHY STRUCTURAL MODELING IS IMPORTANT?

A well-modeled structure ensures design accuracy, better coordination, accurate quantity takeoff, clash detection, and smooth construction documentation.



STRUCTURAL MODELING WORKFLOW



PRIMARY STRUCTURAL ELEMENTS

1. STRUCTURAL COLUMNS

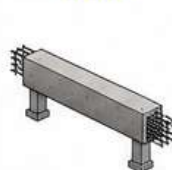


Vertical elements that transfer loads from beams and slabs to the foundation.

Typical Uses:

- Building frames
- Load bearing points
- Grid intersections

2. BEAMS



Horizontal elements that transfer loads from slabs and other beams to columns.

Typical Uses:

- Floor framing
- Roof framing
- Load transfer

3. BEAM SYSTEMS

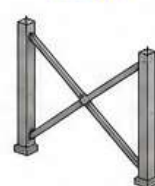


Automatically create a series of beams based on defined rules and boundaries.

Typical Uses:

- Regular framing
- Large open areas
- Efficient modeling

4. BRACES

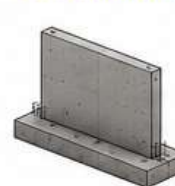


Diagonal members used to provide lateral stability and resist loads.

Typical Uses:

- Wind load resistance
- Seismic resistance
- Estructural stability

5. STRUCTURAL WALLS



Vertical walls that resist lateral loads and support gravity loads from floors and roofs.

Typical Uses:

- Shear walls
- Basement walls
- Retaining walls

6. FLOORS



Horizontal slabs that provide usable surface and transfer loads to beams or walls.

Typical Uses:

- Floor slabs
- Roof slabs
- Podiums

7. ROOF STRUCTURES

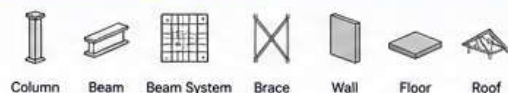


Top covering structural system designed to resist roof loads and transfer to supports.

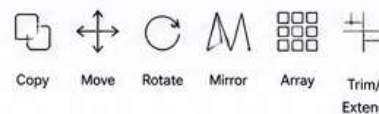
Typical Uses:

- Flat roofs
- Pitched roofs
- Trusses & rafters

COMMON MODELING TOOLS

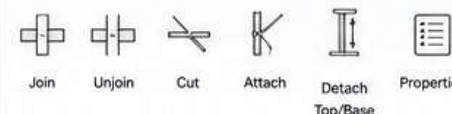


Column Beam Beam System Brace Wall Floor Roof



Copy Move Rotate Mirror Array Trim/Extend

EDITING OPTIONS



Join Unjoin Cut Attach Detach Top/Base Properties

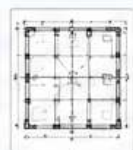
EXAMPLE: STRUCTURAL MODEL



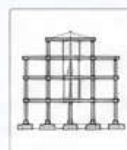
TYPICAL VIEW OUTPUTS



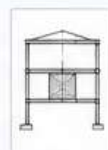
3D VIEW



PLAN VIEW



ELEVATION



SECTION



TIP

Use levels and grids properly before modeling any structural elements. Ensure correct connections between elements for accurate results.



LEARNING OUTCOMES

- ✓ Model structural columns, beams, floors, walls, braces and roofs.
- ✓ Use beam systems for efficient structural framing.
- ✓ Apply editing tools to modify structural elements.
- ✓ Create accurate and coordinated structural models.
- ✓ Follow best practices for clean and efficient modeling.

KEY TOPICS COVERED

1. STRUCTURAL COLUMNS



- Place columns
- Column types
- Move, copy, rotate
- Top & base constraints

2. BEAMS



- Place beams
- Edit beam properties
- Join/Unjoin geometry
- Cut and extend

3. BEAM SYSTEMS



- Create beam systems
- Edit layout rules
- Add/Remove members
- Modify boundaries

4. BRACES



- Place braces
- Brace types
- Attach to framing
- Define offset

5. STRUCTURAL WALLS



- Create walls
- Edit profile
- Wall joins
- Top & base constraints

6. FLOORS



- Create floors
- Edit floor types
- Openings in floors
- Thickness & materials

7. ROOF STRUCTURES



- Roof by footprint
- Truss systems
- Roof slope
- Overhang & eaves

NEXT UNIT

Unit 5:
Reinforcement (Rebar)
Learn how to add and manage reinforcement in structural elements.

UNIT 5

REINFORCEMENT (REBAR)

Learn how to create, modify, and manage reinforcement in concrete elements using Revit Structure tools for accurate detailing and documentation.



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UNIT OVERVIEW

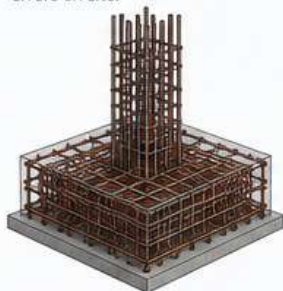
In this unit, you will learn to create and manage reinforcement in concrete elements such as foundations, columns, beams, walls, and slabs. You will explore rebar tools, placement methods, rebar shapes, and documentation through schedules and tags.

YOU WILL LEARN

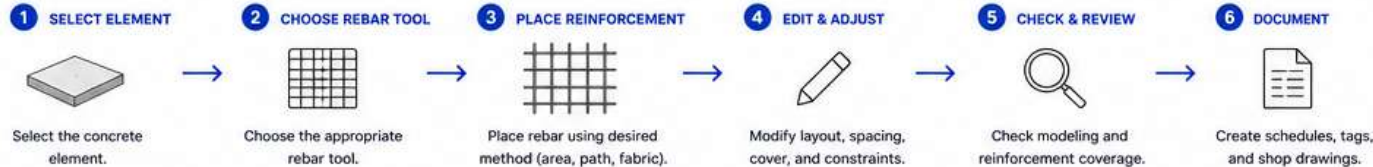
- ✓ Rebar Tools
- ✓ Area Reinforcement
- ✓ Path Reinforcement
- ✓ Fabric Reinforcement
- ✓ Rebar Shapes
- ✓ Bar Bending Schedule
- ✓ Reinforcement Detailing

WHY REINFORCEMENT MATTERS?

Proper reinforcement ensures the structural strength, durability, and safety of concrete elements. Accurate rebar modeling and documentation improve constructability and reduce errors on site.



REINFORCEMENT WORKFLOW



REINFORCEMENT METHODS

1. AREA REINFORCEMENT

Applies rebar in a region with specified direction, spacing and offset.

2. PATH REINFORCEMENT

Places rebar along a sketched path. Ideal for beams, walls and edges.

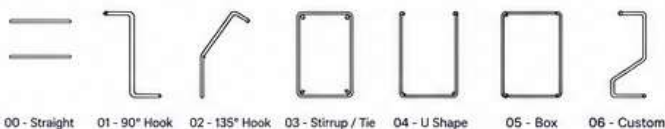
3. FABRIC REINFORCEMENT

Uses predefined fabric for slabs and walls to speed up reinforcement.

4. SINGLE REBAR

Place single bars to add extra reinforcement where required.

REBAR SHAPES EXAMPLES



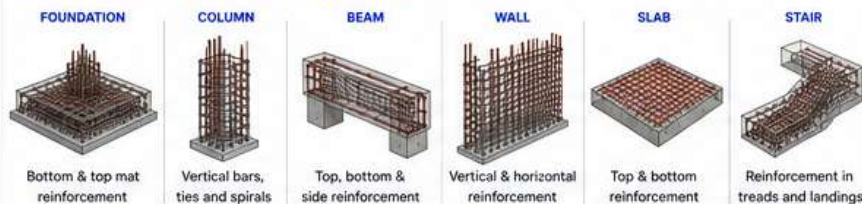
Use predefined or custom rebar shapes to match project and code requirements.

BAR BENDING SCHEDULE EXAMPLE

Mark	Shape Code	Bar Diameter (mm)	No. of Bars	Length (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
B1	00	16	20	3000	60.00	1.58	94.80
B2	03	10	40	1050	42.00	0.62	26.04
B3	02	12	10	1850	18.50	0.89	16.47
B4	01	16	12	600	7.20	1.58	11.38
TOTAL					127.70		148.69

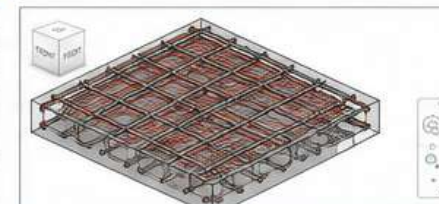
Automatically generate rebar schedules for quantity takeoff and documentation.

REINFORCEMENT IN DIFFERENT ELEMENTS



REBAR VISIBILITY CONTROLS

Reinforcement	
View Visibility States	Edit...
Structural Rebar	☒
Rebar Hidden Lines	☒
Rebar Cover	☒
Rebar Tags	☒
Area Reinforcement	☒
Path Reinforcement	☒
Fabric Reinforcement	☒



KEY TOPICS COVERED

- 1 REBAR TOOLS**
 - Overview of rebar tools
 - Select host & work plane
 - Rebar set types
- 2 AREA REINFORCEMENT**
 - Create in slabs, walls, floors
 - Direction, spacing, offset
 - Extend & split regions
- 3 PATH REINFORCEMENT**
 - Create along path
 - Set bar layout rule
 - Cover & spacing
- 4 FABRIC REINFORCEMENT**
 - Use rebar fabric
 - Adjust layer & spacing
 - Rotate & split fabric
- 5 REBAR SHAPES**
 - Rebar shape browser
 - Create custom shapes
 - Use hooks & bends
- 6 BAR BENDING SCHEDULE**
 - Generate rebar schedule
 - Rebar quantities
 - Export to Excel / PDF
- 7 REINFORCEMENT DETAILING**
 - Rebar visibility settings
 - Tags and annotations
 - Create rebar views



TIP

Always check rebar cover, spacing, and anchorage requirements as per relevant codes and project specifications.

BEST PRACTICES

- Use rebar sets for consistency
- Maintain proper cover and spacing
- Check rebar in 3D and sections
- Use shape codes as per standards
- Generate schedules regularly and review quantities

LEARNING OUTCOMES

- Create and manage reinforcement in concrete elements.
- ✓ Use area, path, fabric and single rebar tools effectively.
- ✓ Create and customize rebar shapes.
- ✓ Generate rebar schedules and documentation.
- ✓ Apply best practices for accurate and efficient rebar modeling.

NEXT UNIT

Unit 6:
Steel Structures
Learn to model steel connections and structural steel systems.

Unit 7:
Structural Documentation
Learn to create sections, details, annotations and documentation for steel structures.

UNIT 7

STRUCTURAL DOCUMENTATION

Learn how to create accurate and clear structural drawings, annotations, and details in Revit Structure for construction documentation.



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UNIT OVERVIEW

In this unit, you will learn how to create detailed structural drawings including plans, sections, elevations, details, dimensions, tags, and annotations. You will also learn how to organize sheets and produce complete, professional construction documents.

YOU WILL LEARN

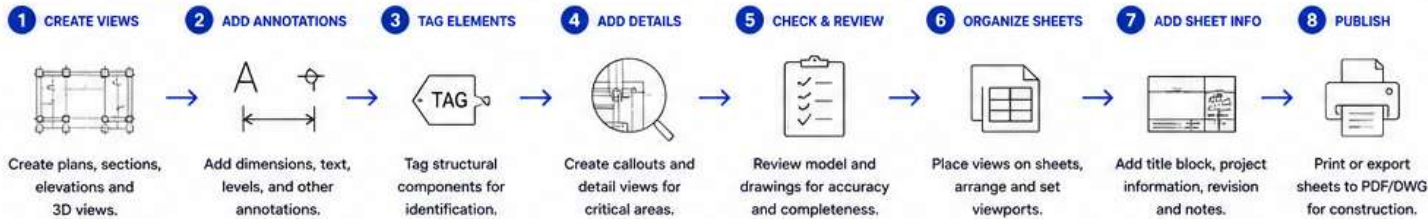
- Sections
- Elevations
- Callouts & Detail Views
- Dimensions
- Tags
- Structural Annotations
- Detailing Tools
- Sheet Creation & Management

WHY STRUCTURAL DOCUMENTATION IS IMPORTANT?

Clear and accurate structural documents ensure proper communication on site, reduce errors, help in quantity estimation, and ensure the structure is built as per the design and standards.



STRUCTURAL DOCUMENTATION WORKFLOW



KEY DRAWING ELEMENTS

1. SECTIONS

Create building sections to show structural elements, levels, and construction details.

2. ELEVATIONS

Create elevations to represent the exterior view of the structure.

3. CALLOUTS & DETAIL VIEWS

Use callouts to create enlarged detail views for particular areas.

4. DIMENSIONS

Add aligned, linear, angular and spot dimensions for clarity.

5. TAGS

Tag columns, beams, walls, slabs, foundations, and rebar for easy identification and scheduling.

6. STRUCTURAL ANNOTATIONS

Use levels, section marks, symbols, notes, revision clouds and other annotations to communicate clearly.

7. DETAILING TOOLS

Use detailing tools for rebar, beam reinforcement, connection details and fabrication information.

8. SHEET CREATION & MANAGEMENT

Create sheets, place views, add title block, manage viewports, revisions and sheet numbering.

KEY TOPICS COVERED

- SECTIONS**
 - Building sections
 - Section properties
 - Section box
- ELEVATIONS**
 - Building elevations
 - Elevation settings
 - Display options
- CALLOUTS & DETAIL VIEWS**
 - Callout placement
 - Detail view creation
 - Detail view properties
- DIMENSIONS**
 - Aligned & linear dimensions
 - Angular & spot dimensions
 - Dimension settings
- TAGS**
 - Structural tags
 - Tag families
 - Multi-category tagging
- STRUCTURAL ANNOTATIONS**
 - Levels & grids
 - Text & leaders
 - Symbols & revision clouds
- DETAILING TOOLS**
 - Rebar annotations
 - Detail lines
 - Component details
- SHEET MANAGEMENT**
 - Sheet creation
 - Title blocks
 - Viewports & revisions



TIP

Maintain a consistent annotation style, use view templates, and follow standards for clear and professional documentation.



Follow standards & company guidelines



Use view templates for consistency



Tag all major structural elements



Check drawings thoroughly before issuing



Keep sheets organized and properly named



Use revision clouds for all changes clearly

BEST PRACTICES



LEARNING OUTCOMES

- ✓ Create sections, elevations and detail views effectively.
- ✓ Add dimensions, tags and annotations as per standards.
- ✓ Organize sheets with title blocks and viewports.
- ✓ Produce clear, accurate and professional structural drawings for construction.

NEXT UNIT



Unit 8: Schedules & Quantity Take-Off

Learn how to create schedules, material take-offs and quantity reports for structural elements.

UNIT 8

SCHEDULES & QUANTITY TAKE-OFF

Learn how to create schedules, calculate quantities, and generate accurate material take-offs in Revit Structure for better planning and estimation.



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UNIT OVERVIEW

In this unit, you will learn to create and customize schedules for all structural elements, extract accurate quantities, and generate detailed material take-offs. This helps in cost estimation, material planning, and project management.

YOU WILL LEARN

- ✓ Material Take-Off
- ✓ Beam Schedule
- ✓ Column Schedule
- ✓ Rebar Schedule
- ✓ Foundation Schedule
- ✓ Quantity Reports
- ✓ Structural Legends
- ✓ Schedule Formatting

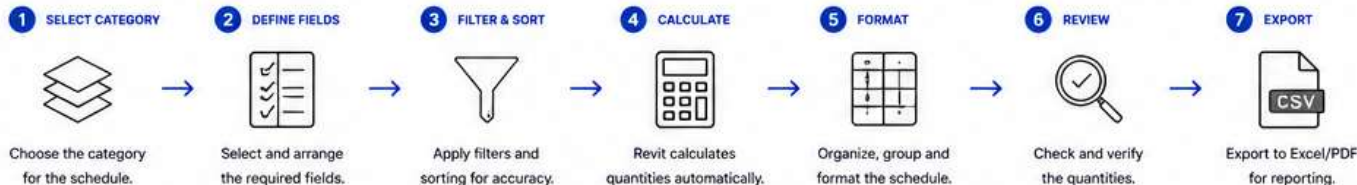


WHY SCHEDULES ARE IMPORTANT?

Schedules provide accurate quantities and material information which helps in cost estimation, procurement, planning, and reduces wastage and construction delays.

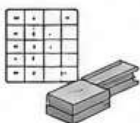


SCHEDULE & QUANTITY TAKE-OFF WORKFLOW



TYPES OF STRUCTURAL SCHEDULES

1. MATERIAL TAKE-OFF



Overall material summary of the project (concrete, steel, rebar, formwork, etc.).

2. BEAM SCHEDULE



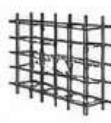
Lists all beams with size, length, level, material, and other parameters.

3. COLUMN SCHEDULE



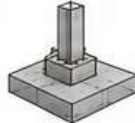
Lists all columns with size, height, level, material, and other parameters.

4. REBAR SCHEDULE



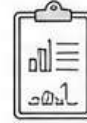
Lists rebar mark, shape, diameter, length, count, and total weight.

5. FOUNDATION SCHEDULE



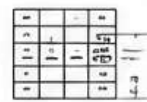
Lists footings/rafts with size, depth, level, concrete grade, and rebar details.

6. QUANTITY REPORTS



Generate quantity reports for concrete, steel, rebar and other materials.

7. STRUCTURAL LEGENDS



Create legends for rebar marks, symbols, materials, and notes.

SAMPLE SCHEDULES

BEAM SCHEDULE

Type Mark	Size (b x d)	Length (mm)	Level	Material
B1	300 x 450	4500	Level 1	Concrete
B2	250 x 450	4200	Level 1	Concrete
B3	230 x 400	3800	Level 2	Concrete
B4	300 x 600	5100	Level 2	Concrete
B5	230 x 450	3600	Level 3	Concrete

COLUMN SCHEDULE

Type Mark	Size (mm)	Height (mm)	Level	Material
C1	450 x 450	3300	Level 1	Concrete
C2	600 x 600	3300	Level 1	Concrete
C3	450 x 450	3300	Level 2	Concrete
C4	600 x 600	3300	Level 2	Concrete
C5	450 x 450	3300	Level 3	Concrete

REBAR SCHEDULE

Mark	Shape Code	Diameter (mm)	Length (mm)	No. of Bars	Total Length (m)	Weight (kg)
R1	00	16	3000	20	60.00	94.80
R2	01	12	2400	35	84.00	74.66
R3	02	10	1500	40	60.00	37.04
R4	03	8	1200	60	72.00	28.45

FOUNDATION SCHEDULE

Mark	Type	Size (mm)	Depth (mm)	Concrete	Rebar
F1	Isolated	1500 x 1500	450	M25	Refer Detail
F2	Isolated	1800 x 1800	450	M25	Refer Detail
F3	Raft	9000 x 9000	600	M30	Refer Detail

MATERIAL TAKE-OFF SUMMARY (EXAMPLE)

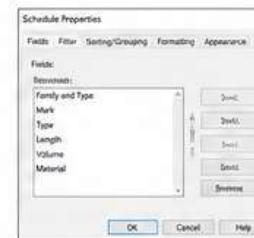
Material	Volume (m³)	Area (m²)	Length (m)	Weight (kg)
Concrete (M25)	125.60	-	-	-
Concrete (M30)	58.30	-	-	-
Reinforcement Steel	-	-	4,560	3,245
Formwork Area	-	2,450	-	-
Structural Steel	-	-	2,350	4,820

QUANTITY REPORTS (EXAMPLE)

Item	Unit	Quantity
Concrete (M25)	m³	125.60
Concrete (M30)	m³	58.30
Reinforcement Steel	kg	3,245
Structural Steel	kg	4,820
Formwork Area	m²	2,450

FILTER & FORMAT OPTIONS

- Filter by Level, Type, Phase, etc.
- Sort by Mark, Type, Material, etc.
- Group by Type/Family
- Calculate totals and subtotals
- Apply conditional formatting
- Insert images and parameters



KEY TOPICS COVERED

1. MATERIAL TAKE-OFF

- Overall material summary
- Concrete, steel, rebar, etc.



2. BEAM SCHEDULE

- Beam type, size, length
- Level, material, comments



3. COLUMN SCHEDULE

- Column type, size, height
- Level, material, comments



4. REBAR SCHEDULE

- Rebar mark, shape, diameter
- Length, count, weight



5. FOUNDATION SCHEDULE

- Footing/raft details
- Size, depth, concrete, rebar



6. QUANTITY REPORTS

- Concrete, steel, rebar
- Formwork, other materials



7. STRUCTURAL LEGENDS

- Rebar marks, symbols
- Materials and notes



8. SCHEDULE MANAGEMENT

- Templates and standards
- Export to Excel/PDF



BEST PRACTICES



TIP

Use schedule templates and filters to save time and maintain consistency across projects.



Use project standards for naming



Keep schedules clean and organized



Verify quantities before final submission



Use filters for accurate take-off



Update schedules after model changes



Export and share in Excel for estimation



LEARNING OUTCOMES

- ✓ Create and customize structural schedules.
- ✓ Extract accurate quantities and material take-offs.
- ✓ Organize and format schedules for reporting.
- ✓ Export schedules for estimation and documentation.

NEXT UNIT >>

Unit 9:
Residential RCC Building Project
Apply your skills to model and document a complete residential RCC building using Revit Structure.

UNIT 9

RESIDENTIAL RCC BUILDING PROJECT

Apply your skills to complete a full Residential RCC Building project in Revit Structure from concept to documentation and quantity take-off.



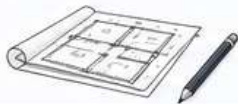
UNIT OVERVIEW

In this unit, you will apply all the concepts learned so far to model, analyze, document and prepare quantity take-off for a complete Residential RCC Building.

You will work on all structural elements including foundations, columns, beams, slabs, stairs, reinforcement and documentation.

YOU WILL LEARN

- ✓ Project Planning & Setup
- ✓ Modeling Foundations
- ✓ Structural Modeling
- ✓ Reinforcement (Rebar)
- ✓ Documentation
- ✓ Schedules & Quantity Take-Off
- ✓ Project Presentation



PROJECT HIGHLIGHTS

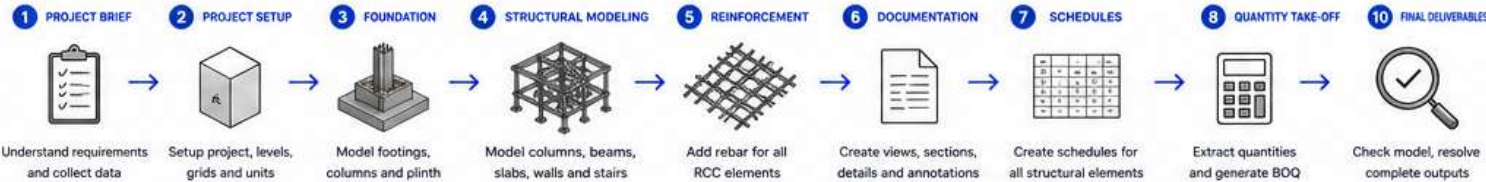
- G+2 Residential RCC Building
- All structural elements
- Complete documentation
- Accurate quantities & BOQ
- Professional deliverables



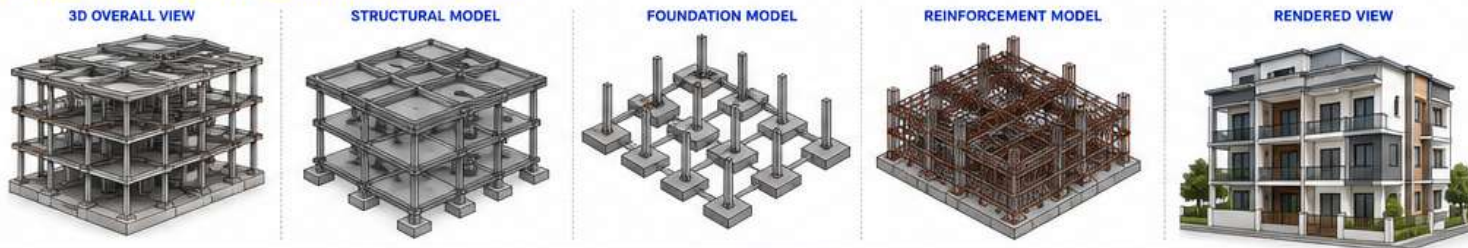
TIP

Plan your modeling approach before starting. Use levels, grids and reference files for accuracy and coordination.

RESIDENTIAL RCC PROJECT WORKFLOW



PROJECT 3D MODEL (G+2 RESIDENTIAL RCC BUILDING)



KEY STRUCTURAL ELEMENTS INCLUDED



SAMPLE DOCUMENTATION OUTPUTS



SAMPLE SCHEDULES & QUANTITY TAKE-OFF

BEAM SCHEDULE (EXAMPLE)					COLUMN SCHEDULE (EXAMPLE)					MATERIAL TAKE-OFF SUMMARY (EXAMPLE)		
Mark	Size (mm)	Length (m)	No.	Volume (m³)	Mark	Size (mm)	Height (m)	No.	Volume (m³)	Material	Unit	Quantity
B1	230 x 450	4.20	18	3.82	C1	300 x 450	9.60	8	1.04	Concrete (M25)	m³	68.75
B2	230 x 450	5.10	12	2.62	C2	300 x 600	9.60	4	0.63	Reinforcement Steel	kg	8,450
B3	230 x 380	3.90	20	3.52	C3	230 x 450	9.60	6	0.41	Formwork Area	m²	1,245.30
Total				10.26	Total				2.28	Total		

BEST PRACTICES

- Follow standards and project requirements
- Maintain model accuracy and consistency
- Use correct families and parameters
- Check and coordinate regularly
- Document clearly and completely
- Verify quantities before submission

LEARNING OUTCOMES

- ✓ Build a complete RCC residential building model.
- ✓ Create professional documentation and detailing.
- ✓ Generate accurate schedules and quantity take-offs.
- ✓ Deliver industry-standard project outputs.

NEXT UNIT

Real-World Projects & Advanced Workflows

Work on real projects and learn advanced Revit Structure workflows.

KEY TOPICS COVERED

- 1 PROJECT PLANNING**
 - Site data & requirements
 - Structure planning
 - Reference files
- 2 STRUCTURAL MODELING**
 - RCC elements modeling
 - Levels, grids and alignment
 - Families and parameters
- 3 REINFORCEMENT**
 - Rebar in beams, columns, slabs
 - Rebar shapes and sets
 - Rebar visibility & filters
- 4 DOCUMENTATION**
 - Plans, elevations, sections
 - Details and callouts
 - Annotations & dimensions
- 5 SCHEDULES**
 - Beam, column, slab schedules
 - Rebar schedules
 - Material schedules
- 6 QUANTITY TAKE-OFF**
 - Material quantities
 - BOQ in schedules
 - Export to Excel/PDF
- 7 PROJECT OUTPUTS**
 - Sheets & drawings
 - Quantity reports
 - Project presentation

UNIT 10

COMMERCIAL STEEL BUILDING PROJECT

Apply your skills to complete a full Commercial Steel Building project in Revit Structure from concept to documentation, schedules and quantity take-off.



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UNIT OVERVIEW

In this unit, you will apply all the concepts learned to model, analyze, document and prepare complete schedules and quantity take-off for a Commercial Steel Building project. You will work on all structural elements including steel columns, beams, trusses, bracing, connections, base plates and foundations along with documentation.

YOU WILL LEARN

- ✓ Project Planning & Setup
- ✓ Steel Building Requirements
- ✓ Structural Modeling (Steel)
- ✓ Connections & Bracing
- ✓ Foundations & Base Plates
- ✓ Documentation & Annotations
- ✓ Schedules & BOQ
- ✓ Quantity Take-Off
- ✓ Project Presentation

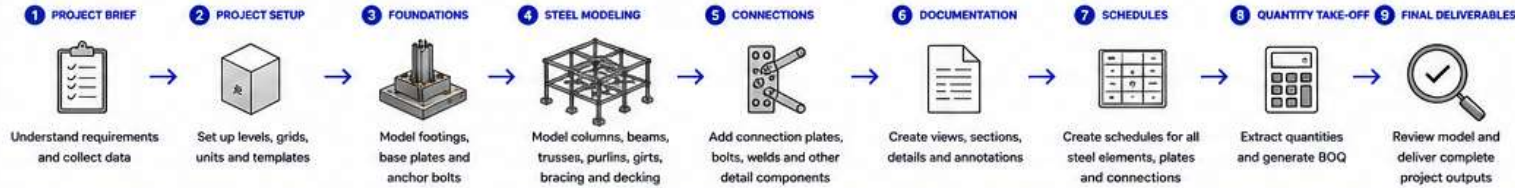


PROJECT HIGHLIGHTS

- ✎ G+1 Commercial Steel Building
- ✎ All structural steel elements
- ✎ Connections, bracing & trusses
- ✎ Complete documentation
- ✎ Accurate quantities & BOQ
- ✎ Professional deliverables



COMMERCIAL STEEL PROJECT WORKFLOW



3D MODEL VIEWS (COMMERCIAL STEEL BUILDING)



KEY STRUCTURAL ELEMENTS INCLUDED



SAMPLE DOCUMENTATION OUTPUTS



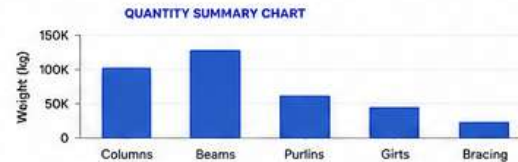
MATERIAL TAKE-OFF SUMMARY (EXAMPLE)				
Item	Material	Unit	Quantity	Total Weight (kg)
Steel Columns	S355	kg	12,450	97,683
Steel Beams	S355	kg	15,800	124,130
Purlins	S355	kg	6,250	49,063
Girts	S355	kg	4,300	33,755
Bracing	S355	kg	2,150	16,878
Base Plates	S355	kg	1,200	1,200
TOTAL STEEL WEIGHT				322,709 kg

SAMPLE SCHEDULES

STEEL COLUMN SCHEDULE (EXAMPLE)					
Mark	Section	Base Level	Top Level	Material	Qty
C1	UC254x254x73	0.000	6.000	S355	12
C2	UC203x203x53	0.000	6.000	S355	8
C3	UC154x154x73	0.000	6.000	S355	4
C4	UC203x203x42	0.000	6.000	S355	6

BEAM SCHEDULE (EXAMPLE)					
Mark	Section	Length (mm)	Material	Qty	
B1	UB305x188x40	6000	S355	18	
B2	UB356x168x31	6000	S355	24	
B2	UB204x148x25	6000	S355	24	
B3	UB305x153x25	6000	S355	16	

TRUSS SCHEDULE (EXAMPLE)				
Mark	Type	Span (mm)	Qty	
T1	Pratt Truss	24000	2	
T2	Pratt Truss	24000	2	



KEY TOPICS COVERED

- 1 PROJECT PLANNING**
 - Site data & requirements
 - Codes & standards
 - Reference files
- 2 STRUCTURAL MODELING**
 - Steel members modeling
 - Levels, grids & alignment
 - Families & parameters
- 3 CONNECTIONS & BRACING**
 - Connection plates & bolts
 - Welds & stiffeners
 - Bracing systems
- 4 FOUNDATIONS & BASE PLATES**
 - Footings & pedestals
 - Base plates & anchor bolts
 - Grouting & level control
- 5 DOCUMENTATION**
 - Plans, elevations, sections
 - Details & callouts
 - Annotations & dimensions
- 6 SCHEDULES**
 - Steel member schedules
 - Connection schedules
 - Material schedules
- 7 QUANTITY TAKE-OFF**
 - Material quantities
 - BOQ in schedules
 - Export to Excel/PDF
- 8 FINAL DELIVERABLES**
 - Sheets & drawings
 - Reports & BOQ
 - Project presentation



TIP

Use proper naming, filters, view templates and standards for accurate modeling and documentation.

BEST PRACTICES



Follow codes and standards



Use correct profiles & connections



Model accurately with proper alignments



Check & resolve warnings regularly



Use schedules for reporting



Verify quantities before final submission



LEARNING OUTCOMES

- ✓ Build a complete commercial steel building model.
- ✓ Create accurate documentation and shop drawings.
- ✓ Generate detailed schedules and quantity take-offs.
- ✓ Deliver professional, industry-standard project outputs.

COMPLETE PROJECT DELIVERABLES



Model File (RVT)



Drawings (PDF/DWG)



Schedules (Excel/PDF)



BOQ (Excel)



Project Presentation

UNIT 11

STRUCTURAL ANALYSIS & COORDINATION

Learn how to perform structural analysis, check design performance, and coordinate the model for accurate, clash-free construction.



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UNIT OVERVIEW

In this unit, you will learn to analyze the structural model, interpret results, perform design checks and ensure model coordination with other disciplines. This helps in delivering safe, efficient and clash-free projects with complete documentation.

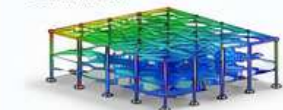
YOU WILL LEARN

- ✓ Model Integrity Check
- ✓ Load Cases & Combinations
- ✓ Supports & Constraints
- ✓ Structural Analysis
- ✓ Result Interpretation
- ✓ Design Checks (Code Compliance)
- ✓ Model Coordination (Clash Detection)
- ✓ Reports & Documentation
- ✓ Project Coordination Best Practices

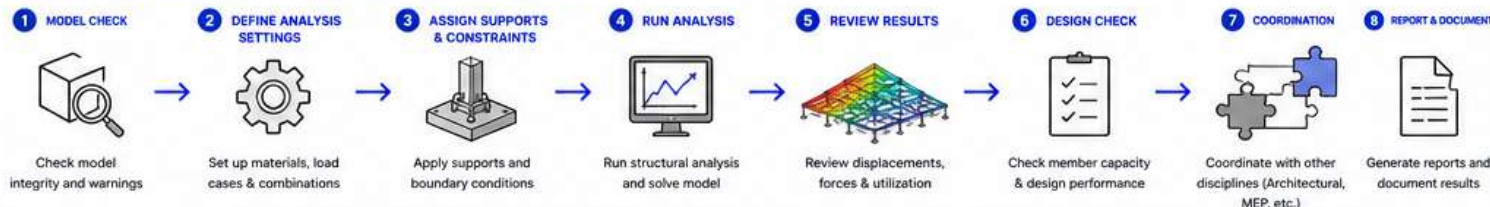


WHY ANALYSIS & COORDINATION ARE IMPORTANT?

- Ensures structural safety and stability
- Validates design under real-world loads
- Identifies weak members and issues early
- Reduces rework and construction delays
- Improves collaboration across disciplines
- Delivers accurate and reliable project documentation

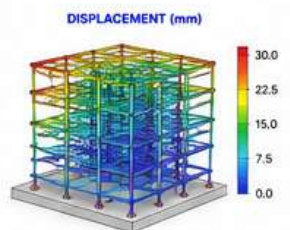


STRUCTURAL ANALYSIS & COORDINATION WORKFLOW

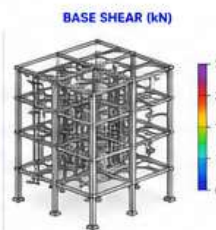
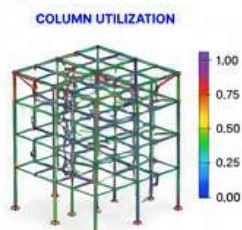
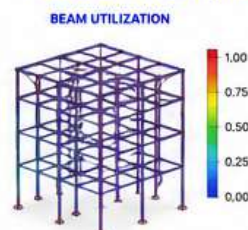


LOAD CASES & COMBINATIONS (EXAMPLES)

TYPES OF LOADS	
Dead Load (DL)	Self weight of all permanent structural elements
Live Load (LL)	Imposed loads (floors, roofs, etc.)
Wind Load (WL)	Wind pressure and suction
Seismic Load (EL)	Earthquake forces (as per code)
Snow Load (SL)	Snow load on roof
Load Combinations	As per code (IS, ACI, ASCE, etc.)



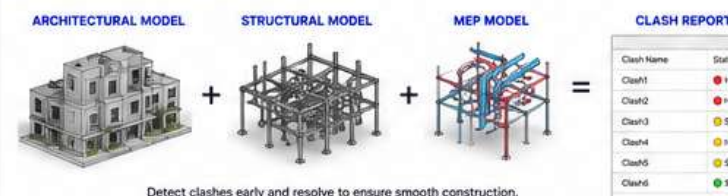
ANALYSIS RESULTS (EXAMPLES)



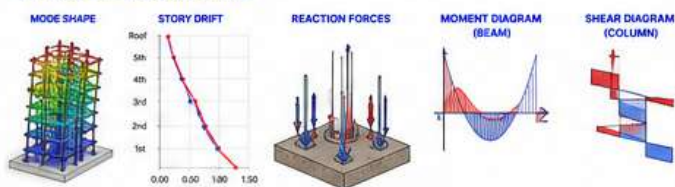
DESIGN CHECKS (CODE COMPLIANCE)

BEAM CHECK	COLUMN CHECK	FOUNDATION CHECK	REBAR CHECK
Utilization: 0.72 < 1.00 Status: OK	Utilization: 0.68 < 1.00 Status: OK	Utilization: 0.61 < 1.00 Status: OK	Utilization: 0.75 < 1.00 Status: OK

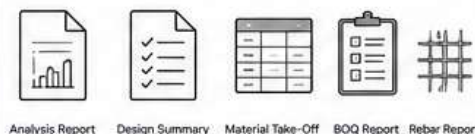
CLASH DETECTION & COORDINATION



TYPICAL ANALYSIS OUTPUTS



REPORTS & DOCUMENTATION



PROJECT COORDINATION BEST PRACTICES

- Maintain model accuracy and consistency
- Use shared coordinates and levels
- Follow naming conventions
- Communicate and resolve issues early
- Regular model audits and reviews
- Use latest standards and project guidelines

KEY TOPICS COVERED

1. MODEL INTEGRITY CHECK

- Warnings and errors
- Model validation tools

2. LOAD CASES & COMBINATIONS

- Load types
- Load combinations
- Load settings

3. SUPPORTS & CONSTRAINTS

- Support conditions
- Restraints and releases

4. STRUCTURAL ANALYSIS

- Run analysis
- Solver settings

5. RESULT INTERPRETATION

- Displacements
- Forces (Axial, Shear, Moment)
- Utilization ratios

6. DESIGN CHECKS

- Code compliance
- Member design
- Utilization checks

7. MODEL COORDINATION

- Clash detection
- Coordination with Architectural & MEP

8. REPORTS & DOCUMENTATION

- Analysis & design reports
- Schedules & BOQ
- Documentation standards



TIP

Always verify model assumptions, check boundary conditions, and review results critically for accurate and safe designs.

BEST PRACTICES



Use correct load data



Validate model regularly



Review results critically



Resolve clashes early



Coordinate with all disciplines



Document clearly

LEARNING OUTCOMES

- ✓ Perform structural analysis using Revit Structure.
- ✓ Interpret analysis results and check design performance.
- ✓ Ensure code compliance and safe structural design.
- ✓ Coordinate models and resolve clashes efficiently.
- ✓ Generate professional reports and documentation.

NEXT UNIT

Capstone Project

Apply all learned concepts to complete a full real-world project from start to finish.

UNIT 12

BIM COORDINATION & PROJECT DELIVERY

Learn how to coordinate models, manage BIM workflows, and deliver accurate, clash-free projects on time.



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UNIT OVERVIEW

In this unit, you will learn how to coordinate architectural, structural, and MEP models, detect and resolve clashes, manage BIM workflows, create deliverables, and follow best practices for BIM-based project delivery using Revit Structure.

YOU WILL LEARN

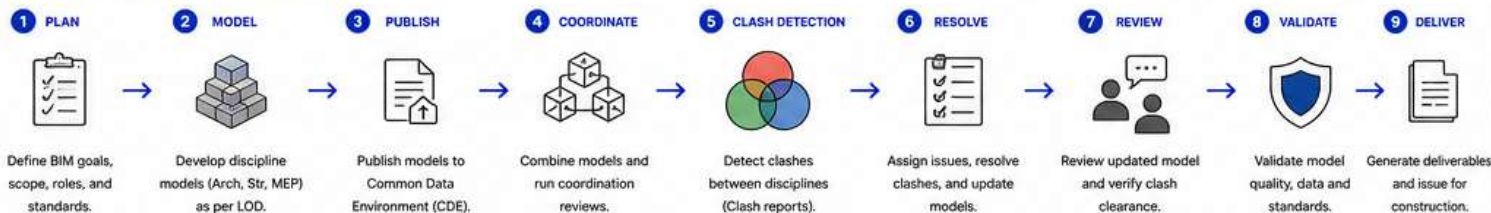
- ✓ BIM Coordination Concepts
- ✓ Model Coordination Workflow
- ✓ Clash Detection & Resolution
- ✓ Coordination Meetings
- ✓ Model Review & Markups
- ✓ 4D / 5D Integration (Overview)
- ✓ LOD & BIM Standards
- ✓ Deliverables & Documentation
- ✓ BIM Project Delivery Best Practices

WHY BIM COORDINATION IS IMPORTANT?

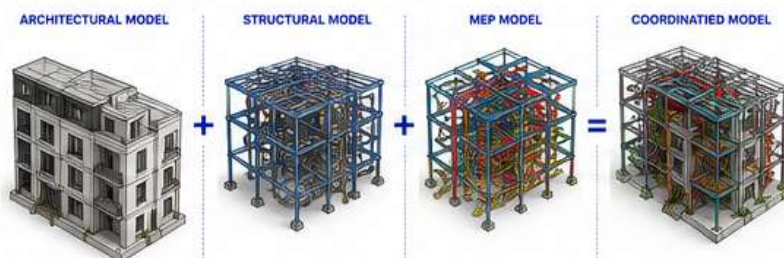
- ✓ Ensures clash-free and coordinated design.
- ✓ Reduces rework, cost and delays.
- ✓ Improves collaboration and communication among all disciplines.
- ✓ Enhances constructability and quality.
- ✓ Supports accurate planning, scheduling and cost estimation.



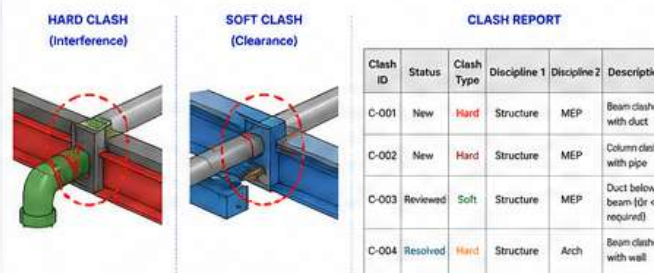
BIM COORDINATION WORKFLOW



3D COORDINATION EXAMPLE



CLASH DETECTION EXAMPLE

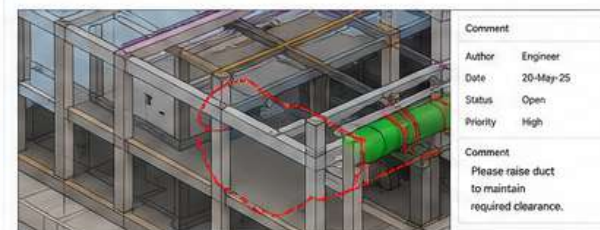


COORDINATION MEETING & ISSUE TRACKING

Issue ID	Issue Description	Discipline	Priority	Assigned To	Status	Due Date
I-001	Beam clashes with duct	Structure / MEP	High	MEP Engineer	Open	25-May-25
I-002	Column clashes with pipe	Structure / MEP	High	MEP Engineer	In Progress	27-May-25
I-003	Duct below beam (cl: < req.)	Structure / MEP	Medium	MEP Engineer	Open	28-May-25
I-004	Beam clashes with wall	Structure / Arch	High	Architect	Resolved	22-May-25



MODEL REVIEW & MARKUPS (NAVISWORKS)



DELIVERABLES



BEST PRACTICES



LEARNING OUTCOMES

- ✓ Coordinate and manage multi-disciplinary BIM models.
- ✓ Detect and resolve clashes effectively.
- ✓ Follow BIM standards and best practices.
- ✓ Deliver accurate, coordinated and high-quality project outputs.

NEXT STEP >>

Capstone Project

Apply all the skills learned to complete a full BIM project from start to finish with coordination and documentation.

KEY TOPICS COVERED

1 BIM COORDINATION CONCEPTS

- BIM dimensions (3D, 4D, 5D, 6D, 7D)
- Roles & responsibilities

2 COORDINATION WORKFLOW

- CDE setup & model exchange
- File naming & version control
- Worksharing & linked models

3 CLASH DETECTION & RESOLUTION

- Clash types (Hard / Soft)
- Clash tests & settings
- Issue tracking & resolution

4 COORDINATION MEETINGS

- Clash report review
- Issue assignment
- Action tracking

5 MODEL REVIEW & MARKUPS

- Model review in Navisworks
- Comments & markups
- Sheet & viewpoint creation

6 4D / 5D INTEGRATION (OVERVIEW)

- Link model with schedule (4D)
- Quantity & cost integration (5D)
- Benefits of 4D / 5D BIM

7 LOD & BIM STANDARDS

- LOD 100 to LOD 500
- BIM execution plan (BEP)
- Standards & naming conventions

8 DELIVERABLES & DOCUMENTATION

- Sheets, views & schedules
- BOQ & quantity reports
- Model deliverables

9 BIM PROJECT DELIVERY BEST PRACTICES

- Collaboration & communication
- Model quality & coordination
- Continuous improvement